

ABSTRACT

A method is disclosed for performing a discrete cosine transform (DCT) using a microprocessor having an instruction set that includes SIMD floating point instructions.

5 In one embodiment, the method includes: (1) receiving a block of integer data having C columns and R rows; and (2) for each row, (a) loading the row data into registers; (b) converting the row data into floating point form so that the registers each hold two floating point row data values; and (c) using SIMD floating point instructions to perform weighted-rotation operations on the values in the registers. Suitable SIMD floating point
10 instructions include the pswap, pfmul, and pfpnacc instructions. For the row-DCT, the data values are preferably ordered in the registers so as to permit the use of these instructions. For the column-DCT, two columns are preferably processed in parallel using SIMD instructions to improve computational efficiency. An intermediate buffer may be used to avoid unnecessary conversions between integer and floating point format.

15